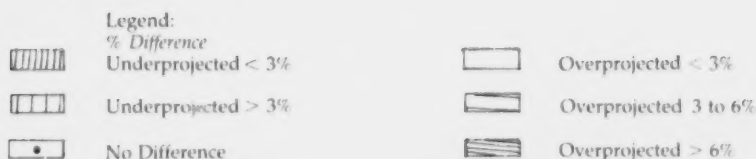


Table 3
Indiana Population Estimates and Projections, 1985 (by County)

County	1985 Estimates	1985 Projections	Differences (Projections - Estimates)		County	1985 Estimates	1985 Projections	Differences (Projections - Estimates)	
			Number	Percent				Number	Percent
Adams	30,200	30,900	700	2.32	Madison	132,900	138,200	5300	3.99
Allen	290,900	300,800	9900	3.40	Marion	780,000	753,500	-26500	-3.40
Bartholomew	65,000	67,300	2300	3.54	Marshall	41,000	40,600	-400	-0.98
Benton	9,900	9,600	-300	-3.03	Martin	11,000	10,800	-200	-1.82
Blackford	15,100	15,000	-100	-0.66	Miami	37,700	40,200	2500	6.63
Boone	38,100	38,500	400	1.05	Monroe	101,400	99,300	-2100	-2.07
Brown	12,600	13,600	1000	7.94	Montgomery	35,600	36,100	500	1.40
Carroll	19,300	20,500	1200	6.22	Morgan	54,400	54,500	100	0.18
Cass	40,100	41,000	900	2.24	Newton	14,100	16,100	2000	14.18
Clark	89,800	93,600	3800	4.23	Noble	36,900	37,100	200	0.54
Clay	24,800	25,200	400	1.61	Ohio	5,400	5,500	100	1.85
Clinton	31,300	31,400	100	0.32	Orange	19,000	19,300	300	1.58
Crawford	10,100	10,500	400	3.96	Owen	16,600	17,200	600	3.61
Daviess	28,800	28,100	-700	-2.43	Parke	16,100	16,900	800	4.97
Dearborn	36,800	36,300	-500	-1.36	Perry	19,200	19,200	0	0.00
Decatur	23,700	24,000	300	1.27	Pike	13,300	13,900	600	4.51
DeKalb	33,700	34,500	800	2.37	Porter	123,500	134,700	11200	9.07
Delaware	122,400	125,100	2700	2.21	Posey	26,400	28,400	2000	7.58
Dubois	35,700	35,600	-100	-0.28	Pulaski	13,300	13,400	100	0.75
Elkhart	145,200	142,300	-2900	-2.00	Putnam	29,900	29,600	-300	-1.00
Fayette	27,700	28,800	1100	3.97	Randolph	28,300	30,000	1700	6.01
Floyd	62,900	63,300	400	0.64	Ripley	25,300	25,500	200	0.79
Fountain	18,700	19,200	500	2.67	Rush	18,800	18,700	-100	-0.53
Franklin	20,400	20,500	100	0.49	St. Joseph	241,000	238,700	-2300	-0.95
Fulton	18,900	20,200	1300	6.88	Scott	20,500	21,200	700	3.41
Gibson	33,800	34,200	400	1.18	Shelby	39,700	40,400	700	1.76
Grant	77,500	78,500	1000	1.29	Spencer	20,300	20,400	100	0.49
Greene	30,500	31,400	900	2.95	Starke	21,200	22,700	1500	7.08
Hamilton	91,000	92,900	1900	2.09	Steuben	25,700	26,500	800	3.11
Hancock	44,400	47,000	2600	5.86	Sullivan	20,600	21,400	800	3.88
Harrison	28,800	30,300	1500	5.21	Switzerland	7,300	7,500	200	2.74
Hendricks	73,600	75,400	1800	2.45	Tippecanoe	123,800	121,100	-2700	-2.18
Henry	50,300	52,700	2400	4.77	Tipton	16,200	16,700	500	3.09
Howard	85,300	87,300	2000	2.34	Union	6,900	7,000	100	1.45
Huntington	35,400	35,700	300	0.85	Vanderburgh	167,600	167,200	-400	-0.24
Jackson	37,100	37,700	600	1.62	Vermillion	17,700	18,700	1000	5.65
Jasper	26,600	28,600	2000	7.52	Vigo	110,400	109,300	-1100	-1.00
Jay	22,100	22,900	800	3.62	Wabash	35,100	36,700	1600	4.56
Jefferson	29,700	31,700	2000	6.73	Warren	8,600	8,900	300	3.49
Jennings	22,800	23,900	1100	4.82	Warrick	45,300	47,300	2000	4.42
Johnson	82,000	82,700	700	0.85	Washington	22,200	22,900	700	3.15
Knox	42,000	41,300	-700	-1.67	Wayne	73,200	73,900	700	0.96
Kosciusko	62,500	64,900	2400	3.84	Wells	24,200	26,200	2000	8.26
Lagrange	27,500	27,700	200	0.73	White	23,500	24,600	1100	4.68
Lake	498,000	507,300	9300	1.87	Whitley	26,300	27,000	700	2.66
LaPorte	106,200	109,300	3100	2.92					
Lawrence	42,400	43,700	1300	3.07	Indiana	5,499,100	5,567,900	68800	1.25

Figure 2
Percentage Difference Between 1985 Estimates and
Projections of Indiana Population (by County)



The seven counties with the greatest *decline* in growth rates—Newton, Brown, Porter, Warrick, Jasper, Hancock, and Hamilton—were all suburban counties. Of the six counties (noted above) with the greatest *advances* in growth rates, four are counties that include major central cities (Indianapolis, Elkhart, South Bend, and Evansville).

Of those 80 counties that grew in the 1970s, 46 continue to grow, but 44 of them are growing at slower rates.

Estimates and Projections

Population projections are based in part on the experiences of the past. Hence, the changes in county growth patterns noted above have led to the differences now observed between the 1985 estimates and the projections for that year.

The 1983 series of county population projections were too *high* for 74 of the state's 92 counties; they were right on target for Perry County, and too *low* for 17 counties (see Table 3). On average for the 92 counties, the projections were 2.5% in error, considering the absolute value of the differences from the estimates.

The projections were too *high* by 5,000 or more persons in Madison, Lake, Allen, and Porter Counties. In Newton County the projections were too *high* by 14.18%; in Porter County the projections came in 9.07% above the Census Bureau's estimates.

The projections were too *low* by 26,500 (3.40%) in Marion County. This was the greatest difference in magnitude in the state. Benton County was the only other county to be more than 3% below the estimates. See Figure 2.

The six counties in which the estimates exceeded the projections by the greatest *number* are metropolitan counties with central cities. The projections were too *low* in Marion, Elkhart, Tippecanoe, St. Joseph, Monroe, and Vigo Counties.

The six counties in which the projections exceeded the estimates by the greatest *percentage* are suburban counties. The pro-

jections were too *high* in Newton, Porter, Wells, Brown, Posey, and Jasper Counties.

These two observations might suggest that the economic conditions of the early 1980s tended to slow the decentralization of the central urban areas. During that period, high interest rates and high unemployment rates may have retarded the growth of single-family dwelling units normally built in suburban counties. Many people may have chosen to move into apartments in the central cities while awaiting lower interest rates and, in the meantime, saving money for down payments. But we promised to abstain from speculation as to causes.

The projections were too low in Marion, Elkhart, Tippecanoe, St. Joseph, Monroe, and Vigo Counties. The projections were too high in Newton, Porter, Wells, Brown, Posey, and Jasper Counties.

What Comes Next?

The State Board of Health and the Indiana Business Research Center intend to produce a new set of population projections for the state's counties in the next two years. This analysis is the first step in that effort.

The next step is to compare the birth, death, and net migration experience of each county for the period 1980 to 1985 with the projected values. In effect, the estimates produced by the Census Bureau must be taken as the best available numbers for each county's population. Hence, the analysis must center on births and deaths because net migration is not directly measurable and becomes a residual value in the process. In addition, we intend to look carefully at the age structure of the population, again using the best available estimates prepared by federal agencies.

From these studies of the 1980-85 experience, new fertility, mortality, and net migration rates will be developed as the basic building blocks for the next set of Indiana county population projections. □



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In this issue . . .

Indiana Population

Even during the rural turnaround in Indiana, a greater proportion of urban counties experienced net in-migration than did rural counties. Furthermore, the "rural renaissance" was not so prevalent in Indiana as it was in other parts of the country.

During 1984, only New York and Pennsylvania, the two northeastern giants, had net migration patterns worse than those in the Midwest, where the average net loss was approximately 27,000.

When all of the states are ranked according to their in/out ratios, six of the bottom ten lie in the Midwest. Indiana, which ranks twelfth from the bottom, barely escapes this list.

The average state in the Midwest gained 77 persons for every 100 it lost. Indiana, with a ratio of .78, ranked fifth among the Midwestern states.

Forty-two percent of the in-migration experienced by Indiana during 1984 can be attributed to the neighboring states of Illinois, Ohio, Kentucky, and Michigan. Texas, Florida, and California provided an additional 18%. These same seven states attracted 57% of the state's out-migration.

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Richard L. Pfister

**Projecting Indiana Households
Part 1: Headship Rates—What They
Are and What They Suggest in
Projecting Indiana Households
Part 2: Household Projections for
Indiana to the Year 2000**

John D. Long

**Why Liability Insurance Prices
Have Risen**



Projecting Indiana Households

Part 1: Headship Rates—What They Are and What They Suggest in Projecting Indiana Households

In this issue . . .

Several issues back (only historians would want more specificity), we published an article on household projections for Indiana, an article that was well received. Just as that issue went to press, our colleague Richard Pfister told us that our methodology was, in his polite terms, less than superior. Now we can provide him with the space to demonstrate an improved approach to household projections based on headship rates. This methodological improvement takes into account the changing ways in which we Americans live. It should offer greater accuracy as a forecasting technique.

Every now and then these pages are used to examine questions of national metaphysical importance. Clearly, insurance rates fall into that category. Liability insurance has moved from being a luxury to being a necessity. All possible villains for the current perceived crisis have been identified. The nightly national news programs have exhausted their sources and have pointed their electronic fingers at the greedy companies, the slipshod courts, and the grasping attorneys. Now we can turn to our resident sage, John Long, for the ultimate answers.

M.J.M.

Richard L. Pfister

The author is professor of business economics and public policy at Indiana University. Thomas C. Hendricks performed the computations for the Indiana projections.

Housing analysts expected a strong housing market immediately after World War II because of the pent-up demand from the war years and the preceding Depression. Demand was then expected to stabilize at the historical relationship to the size and age distribution of the population. Yet throughout the period from 1950 to the late 1970s, the housing market confounded the long-run forecasters by being considerably stronger than predicted. Important questions now are, Will we miss the mark again in housing market forecasts for the next decade? If so, will we be too high or too low?

What explains the unexpectedly strong housing market immediately after World War II? An easy answer is that the average size of households fell so that the number of households grew rapidly. But the important question is, What was happening to cause the decline in household size? Again there are simple answers: the rise in divorce rates, youths leaving home for their own housing units, elderly people living by themselves rather than with their children, and so forth.

We need to go further, however, and ask *why* all of these things happened. A number of explanations have been advanced, but one key element has not received the attention it deserves. That key element is *headship rates*.¹ Headship rates and their changes also need explanation, but they lead us in the direction of more reliable cause-effect relationships and a better understanding of why those earlier forecasts went wrong. A study of headship rates should enable us, in turn, to better forecast the future.

1. The term *headship rate* has not been used widely in the United States, although it is fairly common in European studies of population characteristics. Some analysts who have used this concept in the United States have called it the "incidence of households."

What Are Headship Rates?

The headship rate for a particular cohort (age group) is the ratio of the number of household heads within that cohort to the total number of persons in the cohort.² It is usually expressed as a percentage—that is, as the number of household heads per 100 persons in the cohort.

To illustrate the concept, consider the headship rate for the 45-54 cohort. If all persons between 45 and 54 lived alone and thus headed single-person households, the headship rate would be 100%. If there were an equal number of men and women in this age group and if all were married-couple households (with both spouses within the age group), the headship rate would be 50%. The actual headship rate in 1980 for the 45-54 age group was 56%. Of course, some of the heads of married-couple households had spouses outside this age group. The rate of 56 means simply that the total number of household heads aged 45 to 54 constitutes 56% of all persons within that age bracket.

The "overall headship rate" is the percentage of all persons 15 years and older who are heads of households.

The 15-24 cohort has a low headship rate (it was 16% in 1980) relative to other age groups because most persons of this age still live with their parents or otherwise live in a household without being its head. The "overall headship rate" is the percentage of all persons 15 years and older who are heads of households.

Headship Rates Up, Household Size Down

Prior to World War II, the relationship between U.S. household formation and changes in population by age group was

2. The Bureau of the Census defines a household as one or more individuals occupying a separate housing unit. A household head is the person in whose name a housing unit is owned or rented. A family is defined as two or more persons related by birth, marriage, or adoption who reside together in a separate housing unit.



quite stable. After World War II, however, this relationship became loose and the growth of households could not be predicted on the basis of population change by age group. The change in that relationship was broken by the rather dramatic rise in headship rates, a change that caused forecasts of housing demand to be low in the post-World War II period.

Table 1 shows headship rates by cohort for selected years from 1930 to 1984. Because of the lag in data publication, 1984 was the latest year for which data were available when this study was completed. From 1930 to 1940, the rates were stable except for an increase in the groups 65 and over. The rates rose from 1940 to 1950 for those groups under 35 years. From 1950 to 1960 the rates rose for all cohorts, and the increases continued for most groups through 1980. A comparison of 1980 with 1950 shows that the increases were especially large for the younger age groups and the 75-and-over group. The age groups 45-54 and 55-64 had the smallest relative increases. The ratios for these groups were already high in 1950 so there was not as much room for increases.

The 1984 rates are virtually unchanged from 1980, which may foreshadow a slowdown or even a reversal in the growth of headship rates. The three youngest age groups all showed small declines in rates from 1980 to 1984. Such small declines may not indicate a trend, but they represent a reversal of a strong upward movement in the rates for these age groups since 1930.

The Bureau of the Census has reported that annual increases in the number of U.S. households since 1980 have averaged 1,203,000, which is considerably below the average of 1,568,000 for the 1970s. Changes in household formation since 1980 have been influenced by the recession and the subsequent recovery of the economy. Nevertheless, the data suggest a definite decline in the annual increase in number of households.

For recent years, headship rates are available for different types of households. Since 1960, the family headship rates for all age groups have changed little. Most of the growth in overall age-specific headship rates

resulted from the growth of nonfamily households. Nonfamily households grew as young people set up their own households, lived with other unrelated individuals, and delayed marriage. Other contributing factors were a rise in the number of divorced or separated individuals who lived alone and a rise in the number of surviving elderly spouses who lived alone rather than with their children.

Nonfamily households grew as young people set up their own households, lived with other unrelated individuals, and delayed marriage. Other contributing factors were a rise in the number of divorced or separated individuals who lived alone and a rise in the number of surviving elderly spouses who lived alone rather than with their children.

For family households, there has been a sharp rise in single-parent families, especially female-headed families. As a result, the headship rate for husband-wife families has fallen as the overall family

headship rate has remained nearly constant since 1960.

Separating the Effects of Age Distribution and Headship Rates

Housing market analysts watch closely the changes in number of households because such changes are an important determinant of the demand for housing. Louise B. Russell showed the separate effects of changes in the age distribution and of changes in headship rates upon the growth of U.S. households since 1950.³

By applying the cohort-specific headship rates existing in the first year of each interval to the change in the number of persons in each of the age groups over five-year intervals from 1950 to 1980, she calculated the number of additional households to be expected.

For example, during the period 1970-75, the number of persons in the 30-34 age group grew by 2,262,000. Had the headship

3. See Louise B. Russell, *The Baby Boom Generation and the Economy* (Washington, D.C.: Brookings Studies in Social Economics, 1982).

Table 1
Headship Rates by Age Group
Selected Years, 1930-1984

Age Group*	1930	1940	1950	1960	1970	1980	1984
15-24	6	6	9	10	12	16	14
25-29	{ 33	28	33	40	46	48	47
30-34		38	40	45	49	53	52
35-44		45	45	48	51	55	55
45-54	51	51	49	52	53	56	56
55-64	54	54	53	55	58	58	59
65-74	{ 53	55	54	58	61	65	64
75 & over		59	48	55	63	64	64
Overall rate	n/a	n/a	n/a	42	44	47	47

*For 1930, headship rates were available for the 25-34 and 65+ cohorts, whereas for the other years headship rates were available for the age groups listed.

Source: The figures for 1930, 1940, and 1950 are estimates from Burnham O. Campbell, *Population Changes and Building Cycles*, Bureau of Economic and Business Research, Bulletin 91, University of Illinois, Champaign, 1966, p. 186. The other years were calculated using data from U.S. Bureau of the Census, *Statistical Abstract of the United States*, various years.

rate for this age group remained as it was in 1970, the number of new households with heads aged 30-34 would have been 1,166,000. The actual number of new households with heads aged 30-34 was 1,537,000—371,000 more than "expected"—because the headship rate for this cohort increased substantially from 1970 to 1975.

By summing the differences between the actual and expected households over the various cohorts, Russell estimated how much of the increase in the number of households was the result of changes in the age distribution and how much was the result of changes in headship rates. Had headship rates by cohort remained as they were in 1970, U.S. households would have increased by 5,187,000 from 1970 to 1975. This increase would have resulted simply from the change in population by age group. The actual increase was 7,716,000. The extra 2,529,000 households were the result of increases in headship rates.

The rise in headship rates explains why national housing demand has been much stronger throughout the post-World War II period than had been expected on the basis of changes in population.

For 1975 to 1980, the expected increase was 6,008,000 households, whereas the actual increase was 7,960,000. The extra 1,952,000 households were the result of a rise in headship rates from 1975 to 1980.⁴

The rise in headship rates explains why national housing demand has been much stronger throughout the post-World War II period than had been expected on the basis of changes in population.

What Determines Headship Rates?

Some observers expect key demographic trends to continue, especially the rise in

4. For 1975 to 1980, Russell used the headship rates that existed in 1975. Had she used the headship rates for 1970 to estimate the "expected" addition of households for 1975 to 1980, the excess of actual over expected would have been much larger than the figure of 1,952,000 households.

divorce rates and the growth of nonfamily households among the young and the elderly. The result would be continued growth in the number of households. Research on headship rates, however, indicates that the rates are sensitive to economic variables as well as to demographic factors.⁵

The rise in headship rates from World War II to 1980 was in no small measure the result of rising incomes and falling real costs of housing.

The key economic variables are housing costs and per capita income. The rise in headship rates from World War II to 1980 was in no small measure the result of rising incomes and falling real costs of housing. These economic variables were especially significant in the rise of headship rates for nonfamilies, especially among the young and older cohorts, during the 1970s.

What is the likely trend in the economic determinants of headship rates in the next ten years? These determinants probably will contribute towards a leveling or even a falling of headship rates. Real costs of housing are not likely to decline significantly; any decline certainly would not reach the lower levels of the 1970s. Real per capita incomes probably will rise more than they did in the 1970s, but the rise will not be enough to offset the higher real housing costs compared to the 1970s.

Several other analysts have suggested that the rise in headship rates will slow and could decline in the near future. Louise Russell noted that headship rates are currently so high as to limit the scope for future

5. Bernard J. Frieden and Arthur P. Solomon, *The Nation's Housing: 1975 to 1985* (Cambridge, Mass.: Joint Center for Urban Studies, MIT and Harvard, 1977); Lawrence B. Smith, "Household Headship Rates, Household Formation, and Housing Demand in Canada," *Land Economics* 50: 2 (May 1984), 180-88; Lawrence B. Smith, Kenneth T. Rosen, Anil Markandya, and Pierre-Antoine Ullmo, "The Demand for Housing, Household Headship Rates, and Household Formation: An International Analysis," *Working Paper Series*, #82-55, Center for Real Estate and Urban Economics, University of California, Berkeley, October 1982.

increases. Bernard Frieden and Arthur Solomon believed that the rates were about as high as they could be expected to get for cohorts in the middle age groups. Even in other age groups, there would be limited opportunity for continued rise in the rate. In 1975, 71.7% of single, separated, divorced, and widowed adults over 19 already headed households. Anthony Downs has suggested a slowdown in household formation in the remainder of the 1980s.⁶

Implications for Homebuilding

Suppose headship rates do stabilize or begin to decline in the next several years. What will this mean for the homebuilding industry? If headship rates during the entire 1980-90 period remain on the average at their 1980 levels, households in the U.S. will grow by 11,637,000 because of changes in the sizes of the various cohorts. The baby boom generation will account for nearly two-thirds of that growth.

If headship rates during the entire 1980-90 period remain on the average at their 1980 levels, households in the U.S. will grow by 11,637,000 because of changes in the sizes of the various cohorts. The baby boom generation will account for nearly two-thirds of that growth.

Such an increase would, however, be substantially less than the increase of 15,676,000 households from 1970 to 1980. A reduction of this much in the growth of households would mean a considerably lower level of homebuilding than in the 1970s.

Changes in households by age group of the heads are important to the homebuilding industry because they affect the demand for different types of housing. For the entire decade 1980 to 1990, households

6. Anthony Downs, "The Coming Crunch in Rental Housing," *Annals of the American Academy of Political and Social Sciences* 465 (January 1983): 80. For Russell and Frieden-Solomon, see notes 3 and 5.

with heads between 35-44 years will increase sharply as the baby boom generation moves into this age group. The group just ahead of the baby boomers (ages 45-55) will also experience a substantial increase in households. Headship rates are already high for both these cohorts and are not likely to change much. In these two age groups, households typically buy single-family homes or upgrade their housing if they already own homes. The sharp growth of households with heads in these two age brackets will provide strength to the demand for better quality single-family homes.

Demand from trading up by these two groups could, however, be weaker than in the 1970s. Many of these households bought homes in the 1970s. If they bought in the early 1970s, they probably have mortgages with interest rates of 9% or less. If they bought houses during the speculative fever of the late 1970s, they may have paid inflated prices for bigger houses than they needed. The former group may be reluctant to give up the low-rate mortgage, while the

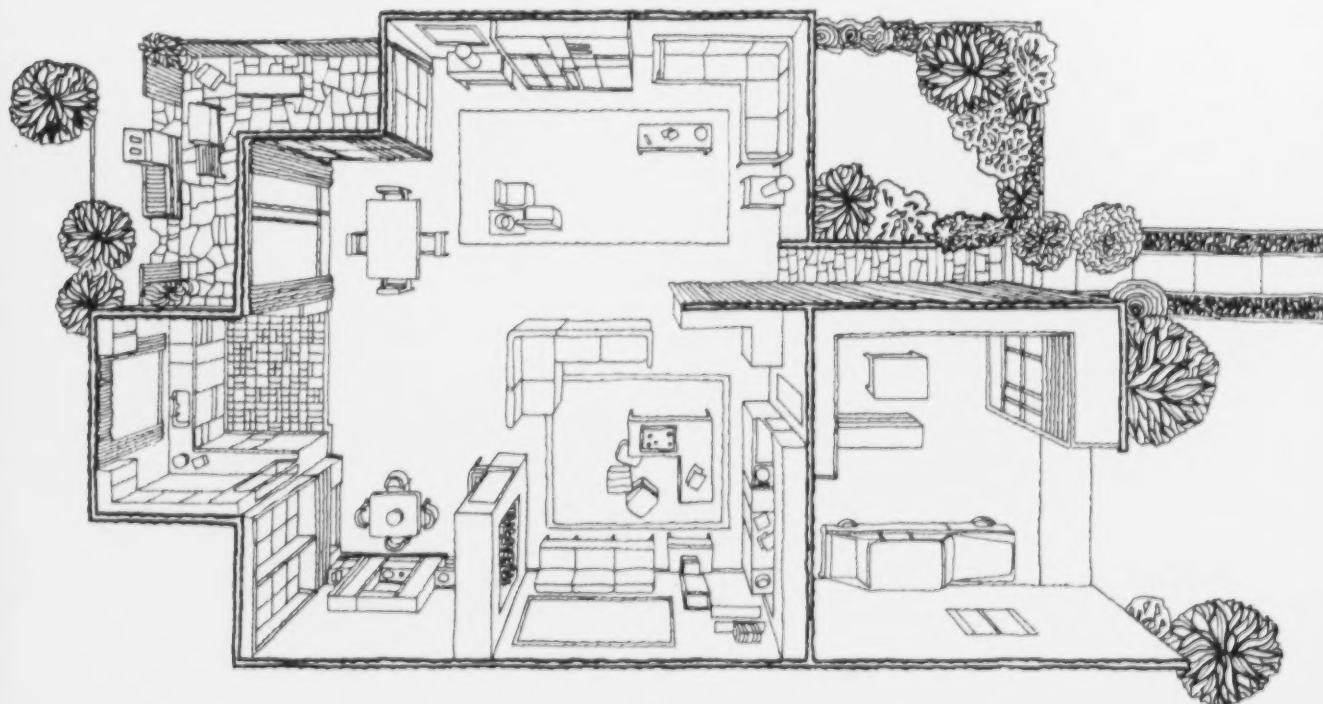
latter group may not find buyers at the prices needed to recoup their investments. Evidence in the early 1980s suggests that trading up by homeowners has been much less than in previous recoveries. If trading up fails to revive, the housing market for higher priced homes could be weaker than in the 1970s.

The greatest decline (even with constant 1980 headship rates) will occur in the 15-24 age group as the baby-bust generation moves into this bracket. The 25-29 age group, with the youngest of the baby boom generation, will grow considerably less than it did in the 1970s. Both of these groups are likely to show declines in the headship rates. The younger householders generally live in apartments, although some in their upper twenties might become first-time homebuyers. During both halves of the 1980s, the number of U.S. household heads in the 30-34 bracket will increase substantially, though less than in the 1970s.

For the over-65 age group, there will be a decline in households as the smaller co-

horts of the late 1920s move in. Headship rates are likely to rise for this group because of increased longevity and more surviving spouses living alone. But higher headship rates will have less effect than the reduction in the size of the cohort group. The demand for housing by the over-65 group will be weaker, therefore, than in the 1970s.

In summary, headship rates are likely to level off in the remainder of the 1980s and into the 1990s. There will be a significant decline in the rate for younger age groups but a continuing rise in the rate for the over-65 groups. The growth in the number of households will be concentrated in the middle age groups as the baby boom bulge moves along. This growth could provide solid demand for single-family homes in the upper price ranges, although much depends upon the trading-up market. The net addition to our housing stock will, however, be less in the next ten years than it was during the 1970s. □



Part 2: Household Projections for Indiana to the Year 2000

This section presents projections of the number of households for Indiana, using the headship-rate method, with different assumptions concerning future headship rates. The result of these projections are then compared with the household projections made by Marcus and Lim, who used a different method.¹

The Constant Assumption. The first assumption about future headship rates is that they will remain constant at their 1980 levels in Indiana through the period to the year 2000. This method will be called the constant assumption.

The number of households in, say, 2000 is the product of the number of persons in a given age cohort and the 1980 headship rate for that cohort. The 1980 headship rates for Indiana were calculated from data in the 1980 Census of Population. (The headship rates for Indiana were almost the same as those for the U.S. in 1980.) Population projections by age group for Indiana were obtained from the *Indiana County Population Projections, 1985-2000*.²

An example will illustrate this calculation. The projected population for the 15-24 age group in 2000 is 879,070. The 1980 headship rate for this age group was 17%. Multiplying these two numbers gives 149,000 as the projected number of households that will be headed by someone 15-24 years of age in the year 2000. The use of this constant assumption method yields the projections of households for 1990 and 2000 that are shown in Table 1.

The 1970-80 Assumption. The next assumption is that each decade—1980 to 1990 and 1990 to 2000—will experience the same percentage change in age-specific headship rates as occurred in the U.S. from 1970 to 1980. For instance, the U.S. headship rate for the 30-34 age group increased by 8% from 1970 to 1980. The Indiana headship rate for this age group in 1980 was 52%.

1. See Morton J. Marcus and John C. S. Lim, "Tentative Household Projections for Indiana Counties," *Indiana Business Review* 59 (September-October 1984): 2-5.

2. These projections were prepared by the Division of Research (now the Indiana Business Research Center), School of Business, Indiana University, 1983.

With the assumption for this method, Indiana's headship rate for this cohort will grow by 8% from 1980 to 1990 and another 8% from 1990 to 2000. Thus, the projected headship rate for the 30-34 age group in Indiana is 56% in 1990 and 61% in 2000.

These headship rates are then multiplied by the projected population in 1990 and 2000 for the 30-34 age group to yield the projected number of households that will be headed by persons in this age group. The same procedure is used for each age group. This assumption concerning headship rates will be labeled the 1970-80 assumption. Table 2 shows the resulting projections and the key numbers used in the calculations.

The 1980-84 Assumption. The third assumption about future headship rates is that

they will follow more closely the national change that occurred in the period 1980-84. During this four-year period, the U.S. headship rates for those age groups younger than 34 years actually declined. Only one of the other cohorts showed a decline; the changes were small except for the 2% rise for the 55-64 group.

The specific assumption in this third calculation is that the percentage change in U.S. headship rates for 1980 to 1984 will be the rate for the entire decade 1980-90 for Indiana and that the same percentage change will occur in the decade 1990 to 2000. This third assumption is referred to as the 1980-84 assumption.

Table 3 contains the U.S. percentage changes for 1980 to 1984 and the projected headship rates for Indiana for 1990 and 2000.

Table 1
Indiana Household Projections, 1990 and 2000,
Based on the Constant Assumption

Age Group	1980 Headship Rates Indiana	Number of Households		
		1980 (Actual)	1990 (Projected)	2000 (Projected)
15-24	17	177,000	154,000	149,000
25-29	49	226,000	222,000	198,000
30-34	52	216,000	229,000	208,000
35-44	54	332,000	446,000	464,000
45-54	55	302,000	322,000	440,000
55-64	58	298,000	289,000	314,000
65 +	64	377,000	446,000	475,000

Table 2
Indiana Household Projections, 1990 and 2000,
Based on the 1970-80 Assumption

Age Group	1980 Headship Rates, Indiana	1970-80 Percent Increase	Projected Headship Rates		Projected Households	
			1990	2000	1990	2000
15-24	17	33.3	23	30	205,000	264,000
25-29	49	4.4	51	53	232,000	216,000
30-34	52	8.2	56	61	248,000	244,000
35-44	54	7.8	58	63	481,000	540,000
45-54	55	5.7	58	61	340,000	490,000
55-64	58	0.0	58	58	289,000	314,000
65 +	64	4.7	67	70	467,000	524,000

Table 3
Indiana Household Projections, 1990 and 2000,
Based on the 1980-84 Assumption

Age Group	1980 Headship Rates, Indiana	1980-84 Percent Change	Projected Headship Rates		Projected Households	
			1990	2000	1990	2000
15-24	17	-12.0	15	13	136,000	114,000
25-29	49	-2.7	48	46	218,000	186,000
30-34	52	-2.2	51	50	225,000	200,000
35-44	54	6.4	54	54	446,000	464,000
45-54	55	0.7	55	56	322,000	447,000
55-64	58	2.2	59	60	294,000	325,000
65+	64	-0.8	63	63	439,000	471,000

The table also shows the projected number of households for 1990 and 2000 that result from the use of these assumptions.

There are several reasons for this rather unusual assumption. It is not reasonable to assume that the changes in headship rates during the four years from 1980 to 1984 will continue for the entire decade at the same rate. The recession, which did not end until late 1982, had an important influence on the formation of households from 1980 through 1982. With the recovery, some of this depressing effect on household formation was reversed. Because the recovery has been less vigorous in Indiana than most recoveries in the postwar period, it has probably not fully offset the effects of the severe recession.

The more pervasive effects are, however, the rise in the cost of housing and the slowing of personal income growth as compared with the 1970s. Both of these factors are important economic determinants of headship rates. Housing costs, in particular, are not likely to decline to the low levels of the 1970s, when mortgage rates lagged behind inflation rates and when large capital gains accrued to homeowners.

This 1980-84 assumption implies that developments during the last six years of the 1980s will average out to be neutral in their effects on headship rates. Thus, the change over the entire decade will on av-

erage be the same as the change from 1980 to 1984.

Table 4 shows the projections of total number of households resulting from these three assumptions concerning future headship rates. The table also shows the household projections made previously by Marcus and Lim.

The assumption made by Marcus and Lim (who did not use the headship rate method) was that the downward trend in number of persons age 20 and over per household would continue to 2000 on a linear path established from 1960 to 1980. The 1970-80 assumption gives the highest projections of households—2,262,000 in 1990 and 2,592,000 in 2000. The 1980-84 assumption yields the lowest projections—2,080,000 in 1990 and 2,207,000 in 2000. The highest projections exceed the lowest by 8.8% in 1990 and by 17.4% in 2000. The absolute differences are 182,000 households in 1990 and 385,000 households in 2000. The Marcus-Lim projections are the second highest among the four, while the constant assumption results in the second lowest projection.

Which Projection Is on the Mark?

Which of the projections is most likely to be on the mark? That question is hard to



answer. Some insights can be gained, however, by trying to evaluate the assumptions underlying each forecast.

All four of the methods use the same projection of population by age group. If the population projections turn out to be off the mark, a projection of households could also be seriously off, even though its assumed headship rates (or household size) turned out to be accurate. The evaluation herein will concern only the assumptions about households and not the population projections themselves.

First, let us examine the three alternative assumptions about future headship rates. The future rates implied by the 1970-80 assumption are likely to be too high. They reflect the substantial rise in headship rates during the 1970s by all age groups below 55 years. The rates for the 65 and over group also rose from 1970 to 1980 (from 62% to 64%), though the increase was much less than in the two previous decades.

Some of the demographic factors that contributed to rising headship rates seem to be changing. The divorce rate in recent years seems to be leveling off or even declining. Many young persons are still delaying marriage (as compared to earlier periods), although the sharp rise in the number of youths living alone or sharing an apartment has abated.

These rates of increase are not likely to continue for two more decades. The headship rates are so high for the cohorts age 30 and above that additional increases are unlikely to occur. Some of the demographic factors that contributed to rising headship rates seem to be changing. The divorce rate in recent years seems to be leveling off or even declining. Many young persons are still delaying marriage (as compared to earlier periods), although the sharp rise in the number of youths living alone or sharing

Table 4
A Comparison of
Indiana Household Projections,
1990 and 2000,
Based on Four Methods

Method	Projected Households	
	1990	2000
Constant Assumption	2,108,000	2,248,000
1970-80 Assumption	2,262,000	2,592,000
1980-84 Assumption	2,080,000	2,207,000
Marcus & Lim	2,176,000	2,386,000

an apartment has abated.³ Some youths who formerly lived alone have moved back with their parents, while others seem to be delaying the move to their own households.

The rise of headship rates among the elderly reflects their improved health and economic status, their increased life expectancy, and the increased number of surviving spouses living alone. The headship rates for this group may continue to rise, but the rate of increase appears to be tapering off. The primary economic determinants of headship rates (namely, housing costs and income) seem to point in the direction of slowing, if not reversing, the rise in headship rates—especially among the younger and older cohorts.

These considerations provide support primarily for the 1980-84 assumption, which captures a small decline in headship rates among the younger cohorts and a slowing of the growth or stabilizing of the headship rates for other cohorts. The difference between the constant and the 1980-84 assumptions are not great, even though the latter gives lower projections. The disadvantage of the constant assumption is that

it freezes the headship rates for the younger cohorts at historic highs. The arguments above suggest that these high rates are not likely to be maintained. The 1980-84 assumption leads to lower headship rates for the three youngest cohorts. The effect of these rate declines on total households is muted by the decrease in population of these age groups in 1990 and 2000. The cohorts of age 35 and above will increase in population, and these groups have steady or slightly rising headship rates under the 1980-84 assumption.

The rise of headship rates among the elderly reflects their improved health and economic status, their increased life expectancy, and the increased number of surviving spouses living alone. The headship rate for this group may continue to rise, but the rate of increase appears to be tapering off.

Some observers suggest more of a reversal in headship rates than is implied by the 1980-84 assumption. To illustrate the effect of such a reversal, a calculation was performed to project households if the headship rates for 1990 and 2000 should drop back to their 1970 levels. The resulting household projections were 1,986,000 for 1990 and 2,125,000 for 2000. The increase of 1990 over 1980 would be just 3%, but the figures for 2000 would be 7% larger than 1990. These projected figures are 4.5% and 3.7% lower, respectively, than the projections based on the 1980-84 assumption.

It seems unlikely, however, that headship rates will soon drop back to the 1970 levels. To do so would require the reversal of some trends or developments that seem well established. □

3. See the discussion of these factors in U.S. Bureau of Census, *Current Population Reports, Projections of the Number of Households and Families: 1986 to 2000*, Series P-25, No. 986, May 1986, p. 4.

